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Class: I MCA B

Subject: Python

Assignment: 4

Case Study 15: Fibonacci Series Generator

Question:

Write a Python program that:

1. Takes n as input.

2. Generates the Fibonacci series up to n terms.

3. Displays the series.

Program and Output

```
def generate_fibonacci(n):

    fib1, fib2 = 0, 1
    if n >= 1:
        print(fib1, end=" ")
    if n >= 2:
        print(fib2, end=" ")

    for i in range(2, n):
        fib3 = fib1 + fib2
        print(fib3, end=" ")
        fib1 = fib2
        fib2 = fib3

n = int(input("Enter the number of terms for the Fibonacci series: "))
generate_fibonacci(n)
```

```
Enter the number of terms for the Fibonacci series: 8
0 1 1 2 3 5 8 13
```

Case Study 14: Discount Calculator

Question:

Write a Python program that:

1. Takes the total purchase amount as input.

2. Applies a discount based on the purchase amount:

o $100-$499: 5% discount

o $500-$999: 10% discount

o $1000 and above: 15% discount

3. Displays the final amount after discount.

Program and Output

```
def calculate_discount(t_amount):
    if 100 <= t_amount <= 499:
        dis_amount = 0.05
    elif 500 <= t_amount <= 999:
        dis_amount = 0.10
    elif t_amount >= 1000:
        dis_amount = 0.15
    else:
        dis_amount = 0

    discount_value = t_amount * dis_amount
    final_amount = t_amount - discount_value

    print(f"Original Amount: ${t_amount}")
    print(f"Discount: ${discount_value}")
    print(f"Final Amount after discount: ${final_amount}")

t_amount = float(input("Enter the total purchase amount: $"))
calculate_discount(t_amount)
```

```
Enter the total purchase amount: $22400
Original Amount: $22400.0
Discount: $3360.0
Final Amount after discount: $19040.0
```

Case Study 2: Grading System

Question:

Write a Python program that:

1. Takes marks for five subjects from the user.

2. Calculates the average percentage.

3. Uses conditional statements (if-elif-else) to determine the grade based on the following criteria:

o 90 and above: A+

o 80-89: A

o 70-79: B

o 60-69: C

o Below 60: Fail

4. Displays the grade.

```python
subject1 = float(input("Enter marks for Subject 1: "))
subject2 = float(input("Enter marks for Subject 2: "))
subject3 = float(input("Enter marks for Subject 3: "))
subject4 = float(input("Enter marks for Subject 4: "))
subject5 = float(input("Enter marks for Subject 5: "))

avg_marks = (subject1 + subject2 + subject3 + subject4 + subject5) / 5
avg_percent = (avg_marks / 100) * 100

if avg_percent >= 90:
    grade = "A+"
elif avg_percent >= 80:
    grade = "A"
elif avg_percent >= 70:
    grade = "B"
elif avg_percent >= 60:
    grade = "C"
else:
    grade = "Fail"

print(f"average percentage is: {avg_percent:.2f}%")
print(f"grade is: {grade}")
```

```
Enter marks for Subject 1: 87
Enter marks for Subject 2: 91
Enter marks for Subject 3: 76
Enter marks for Subject 4: 85
Enter marks for Subject 5: 77
average percentage is: 83.20%
grade is: A
```

Case Study 13: Age Group Classifier

Question:

Write a Python program that:

1. Takes the age of a visitor as input.

2. Categorizes them into groups:

o 0-12: Child

o 13-19: Teenager

o 20-59: Adult

o 60 and above: Senior Citizen

3. Displays the category.

```python
age = int(input("Enter the age: "))

if age < 0:
    print("Invalid age ")
elif age >= 0 and age <= 12:
    print("Child")
elif age >= 13 and age <= 19:
    print("Teenager")
elif age >= 20 and age <= 59:
    print("Adult")
elif age >= 60:
    print("Senior Citizen")
```

```
Enter the age: 67
Senior Citizen
```